P-1165 Event Fire Zone "Cheat Sheet"

Zone	Temperature Range	Observations / Risks	Follow-up
1	Ambient	• No damage.	• None. • All equipment is OK to operate.
2	Up to 150 F	• Smoke, water & fumes from burning chlorinated compounds such as PVC may release chlorine or HCL which can damage electronics or contaminate insulation.	• Cleaning/water-washing to be considered.
3	150 to 400 F	• Vinyl & alkyd paints. blistered or darkened. • Plastics charred or melted. • Lead-tin solder melts. • Electrical wiring and electronic components are damaged.	• Check packing & gaskets for heat affects. • Machinery belts need replacing. • Check for chlorine or HCl contact from burning organic chlorides (PVC).
4	400-800 F	• Severe general damage is anticipated to electrical wiring, windings, circuit boards and motors. • Organic coatings burned-off. • Plastics and rubber melted or charred. • Insulation on wiring destroyed. • Valves, rupture discs and gauges out of calibration. • Roll joints in HEX's might be affected. • Sagging tubing joints on instrumentation might leak. • Consult materials engineer about aluminum/copper alloy pressure components. Aluminum will often require replacement.	• All gaskets and packing are recommended to be replaced with the exception of metallic, spiral or graphite.
5	800-1350 F	• Metallurgical effects that affect vessel integrity and future service occurs requiring extra attention from the Materials Engineer and Inspection Teams. • Spheroidization or tempering may significantly lower the strength of materials used in the construction of pressure components.	• All gaskets and packing should be replaced. • In the areas of highest areas of heat, replace all B-7 bolts. • All structural steel must be repaired or replaced. • Ancillary equipment and small piping, tubing, copper materials should be replaced. (Copper tubing oxidizing to black scale, softened and distorted). • Major equipment including pressure vessels, heat exchangers and rotating equipment should be cleaned, inspected and pressure tested.
6	1350-2500 F	• Possibility of liquid metal embrittlement (LME) is greatest at this temperature. Check areas exposed to liquid metal for LME.	• Obvious replacement.

Attachment 4-1, "Fire Zone Cheat Sheet"